

(19)



JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: 2000071581 A

(43) Date of publication of application: 07.03.00

(51) Int. Cl

**B41J 29/46**

**B41J 29/20**

**G03G 21/00**

**G06F 3/12**

(21) Application number: 10242736

(71) Applicant: NEC NIIGATA LTD

(22) Date of filing: 28.08.98

(72) Inventor: KAWAKAMI OSAMU

**(54) PRINTING SYSTEM**

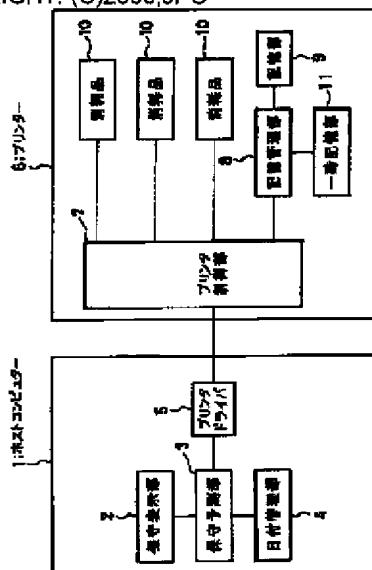
**(57) Abstract:**

**PROBLEM TO BE SOLVED:** To provide a printing system such as a printer or a facsimile capable of securely and efficiently predicting a life of a replaceable component or a consumable article and notifying a user of the result even when the printing system is used in a network.

**SOLUTION:** This printing system consists of a printer 6 that includes a printer controlling section 7, a consumable article 10, memory means 8, 9, 11 and a network communication means and accumulates printing history information into the memory means at each time of printing data, and a host computer 1 connected to the printer 6. The host computer 1 comprises a network communication means, a managing means 4 for managing a date such as a replaced date of the consumable article 10, a means 3 for reading the printing history information from the printer 6, a means 3 for predicting a date to replace the article based on the printing history information read from the printer 6 and an indicating means 2 for indicating

the predicted result of each consumable article. An interval for monitoring the printing information accumulated in the printer can be varied from the host computer.

COPYRIGHT: (C)2000,JPO



**\* NOTICES \***

**JP0 and INPIT are not responsible for any damages caused by the use of this translation.**

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

**CLAIMS**

---

**[Claim(s)]**

**[Claim 1]**From print record information of print data of a printer, image density information is searched for per page, An information processor having calculated an effective printing amount from this image density information and printing page number of sheets, having compared this effective printing amount with default value about a consumption degree of predetermined consumable goods of said printer defined beforehand, and having a means to predict exchange time of consumable goods of said printer.

**[Claim 2]**The information processor according to claim 1 characterized by what a means to predict exchange time of said consumable goods is started for by batch performed on said information processor.

**[Claim 3]**A printer provided with a means to memorize print record information of print data, Are a host computer linked to said printer, read print record information of print data which said printer memorizes, and This print record information, A printing system provided with a host computer provided with a means to compare default value about a consumption degree of predetermined consumable goods of said printer defined beforehand, and to predict exchange time of consumable goods of said printer.

**[Claim 4]**The printing system according to claim 3 characterized by what a means to predict exchange time of said consumable goods is started for by batch performed on said host computer.

**[Claim 5]**Print record information is read from a printer and it is this print record information. A means to compare default value about a consumption degree of predetermined consumable goods of said printer defined beforehand, and to predict exchange time of consumable goods of said printer.

It had a means to be the printer provided with the above, to receive a printing demand from said host computer, and to memorize print record information whenever it prints.

**[Claim 6]**A printer which accumulates print record information in said memory measure for every data printing including a printer control part, 1 or two or more consumable goods, a memory measure, and a network communication means, Are a host computer connected to said printer, and A network communication means, The date management tool for managing a date from a replacement date of consumable goods, and a means to read said print record information, A means to predict whether exchange time of consumable goods, etc. need to perform maintenance from print record information read from said printer, A printing system which is equipped with a displaying means which displays prediction results, such as existence of the necessity for maintenance for every consumable goods, and into which monitoring intervals of printed information accumulated in said printer from said host computer side are changed.

**\* NOTICES \***

JPO and INPI are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

**DETAILED DESCRIPTION**

---

**[Detailed Description of the Invention]****[0001]**

[Field of the Invention]Especially this invention relates to the printing system which applies to a client-server network printer etc. and is made suitable about a printing system.

**[0002]**

[Description of the Prior Art]In recent years, in a printer, when the kind of consumable goods like a color developing material and a toner is increasing with colorization and it exhausts, the kind of replacement parts like the belt and developing drum which need exchange is also increasing. Consumption of the service parts containing these consumable goods and replacement parts is also intense with improvement in the speed or a network.

[0003]It depends for the exchange time of those parts on the frequency in use of a printer, printing data volume, and data density greatly. For this reason, generally it was difficult to predict the exchange time of replacement parts or consumable goods, replacement parts and consumable goods were prepared beforehand, and the problem that it must exchange after the alarm by which an operator directs those exchange is notified has arisen.

[0004]The situation of the consumable goods used only for the printer side in each unit in order to solve this problem, The residual life time of each unit itself is always supervised, and the method of giving the function to tell a user about exchange time, while displaying and printing the residue of consumable goods, a full situation, and residual life time to an operation display is indicated, for example to JP,H4-6571,A or JP,H4-239679,A.

[0005]For example, to JP,H7-246758,A, the method of giving a means by which only the host computer side accumulates the output number of sheets of a printer, a means to memorize the time of the replacement date of replacement parts and consumable goods, and the means that the next time of parts replacement-date-prediction-notifies based on these data is indicated.

**[0006]**

[Problem(s) to be Solved by the Invention]However, the conventional method mentioned above has a problem shown below.

[0007]First, the Prior art indicated to above-mentioned JP,H4-6571,A, If it is going to carry out processing based on printing data in order to raise the accuracy of life detection since the data from a counter is monitored continuously, If CPU tends to be spent on the processing, and the throughput of CPU tends to decline and you are going to make it reduce the processing load of CPU on the contrary, in order to have to reduce the data to acquire, the accuracy of life detection falls and there is a problem of becoming less practical.

[0008]By the conventional method indicated to above-mentioned JP,H4-239679,A, performing investigation of printing number of sheets, resistance welding time, etc. and calculation of parts life time at the time of starting of a printer and off-line is described so that print operation may not be affected, but. When it is going to give advanced throughput, such as calculation of not only a memory measure but parts life time, to a printer, there is a problem that the cost price of a printer will become remarkably high.

[0009]In the Prior art proposed by JP,H7-246758,A. Since a storage parts store and a life prediction part are given only to the host computer side and processed, As it has spread in

recent years, when using on a network, the problem of wasting resources, such as a problem of taking the long access time for acquiring the information on a printer, and capacity of hard disk drive by the side of a host computer, arises.

[0010]It is providing printing systems of which this invention's can be made in view of the above-mentioned problem, the main purpose's can predict the life of replacement parts or consumable goods efficiently and correctly also in the use on a network, and a user can be notified, such as a printer and a facsimile.

[0011]

[Means for Solving the Problem]A printing system of this invention which attains said purpose, A printer provided with a means to memorize print record information of print data, Are a host computer linked to said printer, read print record information of print data which said printer memorizes, and This print record information, It has a host computer provided with a means to compare default value about a consumption degree of predetermined consumable goods of said printer defined beforehand, and to predict exchange time of consumable goods of said printer, and is constituted.

[0012]

[Embodiment of the Invention]In the desirable 1 embodiment the printing system concerning this invention, A printer control part (7 of drawing 1), 1, or two or more consumable goods (10 of drawing 1), A memory measure (8, 9, 11 of drawing 1) and a network communication means are included, For every data printing, are print record information a host computer (1 of drawing 1) connected to the printer accumulated in said memory measure, and (6 of drawing 1) and said printer, and A network communication means, The date management tool (4 of drawing 1) for managing the date from the replacement date of consumable goods, A means (3 of drawing 1) to predict whether the exchange time of consumable goods, etc. need to perform maintenance from a means to read said print record information, and the print record information read from said printer, It has a displaying means (2 of drawing 1) which displays prediction results, such as existence of the necessity for the maintenance for every consumable goods, and the monitoring intervals of the printed information accumulated in said printer from said host computer side are changed. The means and (b) this print record information which read the print record information of the print data which the (a) aforementioned printer memorizes which possesses this invention to the above-mentioned host computer in the 1 embodiment, A means to compare the default value about the consumption degree of the predetermined consumable goods of said printer defined beforehand, and to predict the exchange time of the consumable goods of said printer, And the programmed control performed with the means, \*\*, and the above-mentioned host computer which are controlled to display the (c) aforementioned prediction result on a display may realize the function. In this case, the above-mentioned program is stored in recording media, such as a floppy disk and CD-ROM, and this invention can be carried out because a host computer loads this program to main memory and executes it. This invention also contains the above-mentioned recording medium.

[0013]

[Example]The above-mentioned embodiment of the invention is described below with reference to Drawings about working example of this invention that it should explain still in detail.

[0014][Working example 1] The printer concerning the 1st working example of this invention is explained with reference to drawing 1. Drawing 1 is a figure for explaining the composition of the printer concerning the 1st working example.

[0015]First, if the composition of this example is explained using drawing 1, this example will consist of network wiring which connects these with the host computer 1 and the printer 2. The host computer 1 consists of the maintenance indicator 2, the maintenance forecasting part 3, the date Management Department 4, and the printer driver 5, and the printer 6, It consists of the consumable goods 10 for [, such as developing materials, such as the storage parts stores 9, such as the control section 7 of a printer, the storage management part 8, and a hard disk, a toner, and ink, and a belt, ] maintenance, and the temporary storage part 11 of memory information.

[0016]Next, explanation of operation of this example will send the printing data sent out from

application to the printer control part 7 via the printer driver 5. The printer control part 7 passes the page total based on the print data for every date or color, print data, etc. to the storage management part 8 in parallel to the usual print operation. The storage management part 8 is written in the storage parts store 9, such as a hard disk, processing information, including image density etc., based on print data, and keeping it with the page total for every date or color, and a consumable-goods residue to the temporary storage part 11 which are memories, such as RAM. The date etc. which exchanged consumable goods are written in the storage parts store 9.

[0017]And the maintenance forecasting part 3 of the host computer 1 reads the above-mentioned data from the storage parts store 9 of a printer via the storage management part 8, when there are no time and printing job which the user set up, and it performs life prediction by batch processing. Life prediction is performed based on the data of the accumulation image density of a print output, the accumulation result of output number of sheets, the memory content of the day entry to which consumable-goods empty alarm was outputted, the present day entry from the date Management Department 4, etc., and notifies a user for the next alarm generation prediction day of a calculation result via the maintenance indicator 2.

[0018]And when consumable goods are lost or a user exchanges consumable goods after notifying alarm, a sensor detects that covering of the printer, etc. could open and consumable goods were filled up, and the storage management part 8 resets information, including the accumulation image density of the storage parts store 9, the accumulation result of output number of sheets, etc.

[0019]Thus, by according to this example, forming only a means to memorize a printing history in the printer 6 side, and forming the means which carries out batch processing of the advanced calculation of the life of parts, etc. to the host computer 1 side, Division of roles of each device which constitutes a system is clarified, the rise of the cost price of the printer 6 can be pressed down to the minimum, and exact life prediction can be performed.

[0020]By the host computer's 1 facing the data stored in the memory measure of the printer 6 acquiring, and forming a means by which a user can set up the stage of acquisition arbitrarily, An excessive failure is not given to the circuit which connects throughput, and the printer 6 and the host computer 1 of CPU of the printer 6. the prediction in which each user of each computer is the same even when two or more computers are connected on the network, since the storage parts store 9 is in the printer 6 side — \*\*\*\*\* — things are made.

[0021][Working example 2] Next, the printer concerning the 2nd working example of this invention is explained with reference to drawing 2. Drawing 2 is a figure for explaining the composition of the printer concerning the 2nd working example.

[0022]As shown in drawing 2, unlike the 1st above mentioned working example, the 2nd working example installs the storage management part 8 in the host computer 1 side. By having such composition, can reduce further and the load by the side of the printer 6 the life of consumable goods, The maintenance forecasting part 3 can perform with a next replacement date correctly at the stage which the user set up arbitrarily based on the data of the history of the print memorized by the storage parts store 9 of the printer 6, the day entry memorized by the date Management Department 4, etc.

[0023][Working example 3] Next, the printer concerning the 3rd working example of this invention is explained with reference to drawing 3. Drawing 3 is a figure for explaining the composition of the printer concerning the 3rd working example.

[0024]As shown in drawing 3, unlike the 1st above mentioned working example, the 3rd working example installs the storage management part 8 and the temporary storage part 11 in the host computer 1 side. The life of consumable goods can be predicted by having such composition as well as the 1st above mentioned working example.

[0025]In the case of this example, since it is the composition of using the information memorized by the temporary storage part 11 for the memory by the side of the host computer 1, etc. and the composition by the side of the printer 6 can be simplified, the cost reduction of a printer can be planned.

[0026][Working example 4] Next, the printer concerning the 4th working example of this invention is explained with reference to drawing 4. Drawing 4 is a figure for explaining the composition of

the printer concerning the 4th working example.

[0027]As shown in drawing 4, the 4th working example connects two or more host computers 1 in the network 14, and carries out package control of the printer 6 using the server host computer 12. Thus, the life of consumable goods can predict the life of consumable goods by having composition which installs the storage management part 8 and the temporary storage part 11 in the server host computer 12 as well as the 1st above mentioned working example.

[0028]In this example, the print data operate as a conventional network printer via the server host computer 12, and the storage management part 8, It carries out by writing in the storage parts store 9 by the side of a printer, searching for information, including image density etc., based on the printing data spooled to the server host computer 12, and keeping it with the page total for every date or color, and a consumable-goods residue to the temporary storage part 11 which are memories, such as RAM.

[0029]In this example, the composition by the side of a printer can be pressed down to the minimum, and the effect of a cost reduction can also be expected, and the composition of host computers other than the server host computer on a network can also be simplified.

[0030]

[Effect of the Invention]The page total [ according to / as explained above / this invention ] based on the print data for every date or color to the printer side, Add and form only a means to memorize the printing history of print data etc., and to the host computer side. By forming the batch processing means [ calculation / of the life calculation of parts, etc. / advanced ] based on these data, division of roles of each device which constitutes a system is clarified, the rise of the cost price of a printer is pressed down to the minimum, and the effect that exact life prediction can be performed is done so.

[0031]By a host computer's facing the data stored in the memory measure of a printer acquiring, and forming a means by which a user can set up the stage of acquisition arbitrarily, The effect that prediction of an exact life and use with a network can be enabled is done so, without covering an excessive processing load over the circuit which connects throughput, and the printer and host computer of CPU of a printer.

---

[Translation done.]

**\* NOTICES \***

JPO and INPI are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

**PRIOR ART**

---

[Description of the Prior Art] In recent years, in a printer, when the kind of consumable goods like a color developing material and a toner is increasing with colorization and it exhausts, the kind of replacement parts like the belt and developing drum which need exchange is also increasing. Consumption of the service parts containing these consumable goods and replacement parts is also intense with improvement in the speed or a network.

[0003] It depends for the exchange time of those parts on the frequency in use of a printer, printing data volume, and data density greatly. For this reason, generally it was difficult to predict the exchange time of replacement parts or consumable goods, replacement parts and consumable goods were prepared beforehand, and the problem that it must exchange after the alarm by which an operator directs those exchange is notified has arisen.

[0004] The situation of the consumable goods used only for the printer side in each unit in order to solve this problem, The residual life time of each unit itself is always supervised, and the method of giving the function to tell a user about exchange time, while displaying and printing the residue of consumable goods, a full situation, and residual life time to an operation display is indicated, for example to JP,H4-6571,A or JP,H4-239679,A.

[0005] For example, to JP,H7-246758,A, the method of giving a means by which only the host computer side accumulates the output number of sheets of a printer, a means to memorize the time of the replacement date of replacement parts and consumable goods, and the means that the next time of parts replacement-date-prediction-notifies based on these data is indicated.

---

[Translation done.]

**\* NOTICES \***

JPO and INPI are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

**DESCRIPTION OF DRAWINGS**

---

**[Brief Description of the Drawings]**

[Drawing 1]It is a figure for explaining the composition of the printing system concerning the 1st working example of this invention.

[Drawing 2]It is a figure for explaining the composition of the printing system concerning the 2nd working example of this invention.

[Drawing 3]It is a figure for explaining the composition of the printing system concerning the 3rd working example of this invention.

[Drawing 4]It is a figure for explaining the composition of the printing system concerning the 4th working example of this invention.

**[Description of Notations]**

- 1 Host computer
- 2 Maintenance indicator
- 3 Maintenance forecasting part
- 4 Date Management Department
- 5 Printer driver
- 6 Printer
- 7 Printer control part
- 8 Storage management part
- 9 Storage parts store
- 10 Consumable goods
- 11 Temporary storage part
- 12 Server host computer
- 13 Network board
- 14 Network

---

**[Translation done.]**

---

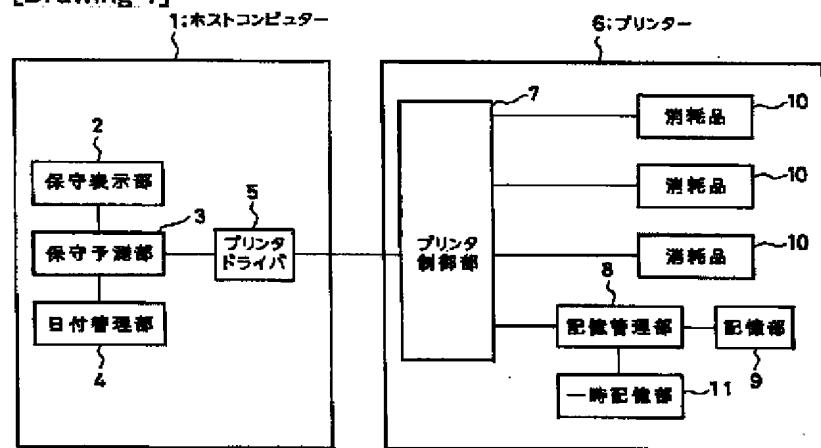
## \* NOTICES \*

JPPO and INPIT are not responsible for any damages caused by the use of this translation.

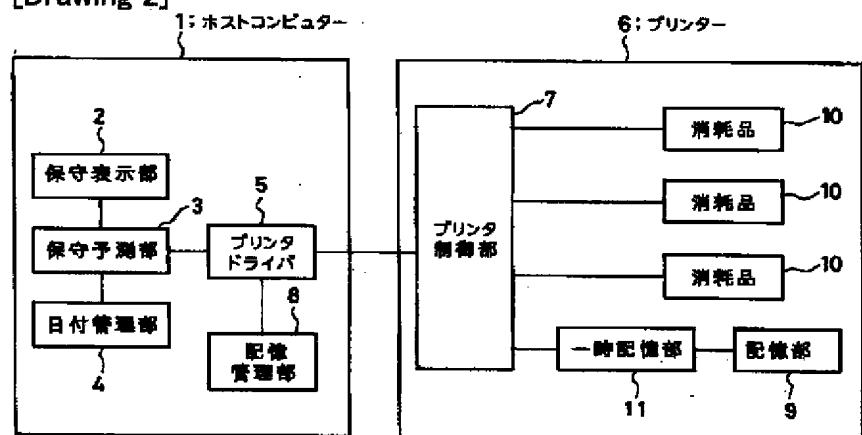
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

**DRAWINGS**

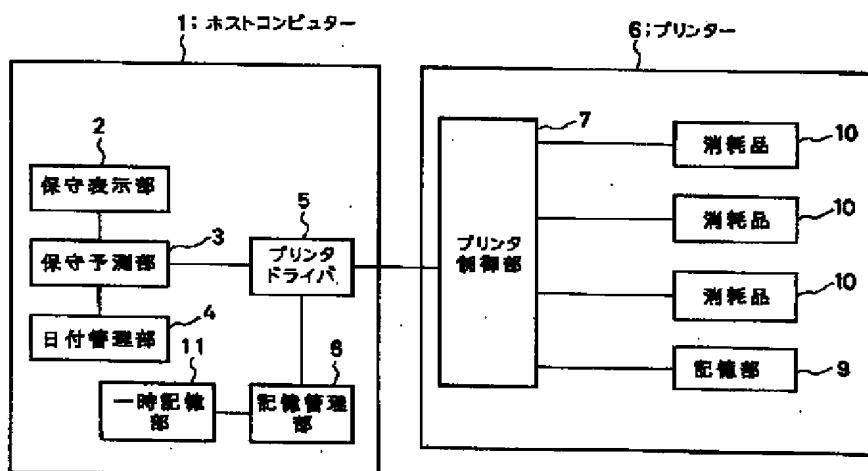
[Drawing 1]



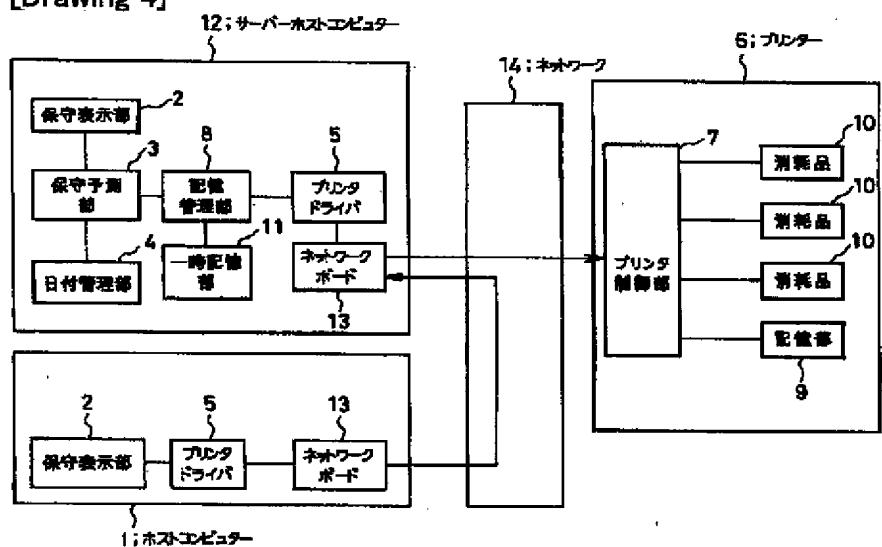
[Drawing 2]



[Drawing 3]



[Drawing 4]




---

[Translation done.]

**\* NOTICES \***

**JPO and INPIT are not responsible for any damages caused by the use of this translation.**

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

**WRITTEN AMENDMENT**

---

**[Written Amendment]**

[Filing date]Heisei 11(1999) June 25 (1999.6.25)

[Amendment 1]

[Document to be Amended]Description

[Item(s) to be Amended]Claims

[Method of Amendment]Change

[Proposed Amendment]

[Claim(s)]

[Claim 1]A printer which accumulates print record information in said memory measure for every data printing including a printer control part, 1 or two or more consumable goods, a memory measure, and a network communication means,  
It is a host computer connected to said printer,

A network communication means and the date management tool for managing a date from a replacement date of consumable goods, It has a means to predict whether exchange time of consumable goods, etc. need to perform maintenance from a means to read said print record information, and print record information read from said printer, and a displaying means which displays prediction results, such as existence of the necessity for maintenance for every consumable goods,

A printing system into which monitoring intervals of printed information accumulated in said printer from said host computer side are changed.

[Claim 2]A printer which accumulates print record information in said memory measure for every data printing including a printer control part, 1 or two or more consumable goods, a memory measure, and a network communication means,

It is a host computer which carries out interconnection via said printer, and other computers and networks,

A network communication means and the date management tool for managing a date from a replacement date of consumable goods, A means to read said print record information, and a memory measure which memorizes print record information from said printer, It has a means to predict whether exchange time of consumable goods, etc. need to perform maintenance from print record information read to said memory measure, and a displaying means which displays prediction results, such as existence of the necessity for maintenance for every consumable goods,

A printing system into which monitoring intervals of printed information accumulated in said printer from said host computer side are changed.

[Claim 3]A means to read said print record information, and a means to predict exchange time of consumable goods from said print record information, The printing system according to claim 1 or 2 characterized by what at least one or more means of a means to display said prediction result are started for by batch performed with said host computer.

[Claim 4]The printing system according to any one of claims 1 to 3 with which said print record information is characterized by what printing number of sheets, image density of print data, and

printing time are included for at least.

[Claim 5] In a host computer linked to a printer provided with a memory measure which memorizes print record information of print data,

(a) A means which reads print record information of print data which said printer memorizes,  
(b) a means to compare this print record information with default value about a consumption degree of predetermined consumable goods of said printer defined beforehand, and to predict exchange time of consumable goods of said printer — and

(c) A means to control to display said prediction result on a display,

A recording medium which recorded a program for operating each means of \*\*\*\*\* (a) thru/or  
(c) with said host computer.

[Amendment 2]

[Document to be Amended]Description

[Item(s) to be Amended]0011

[Method of Amendment]Change

[Proposed Amendment]

[0011]

[Means for Solving the Problem]A printing system of this invention which attains said purpose, A printer which accumulates print record information in said memory measure for every data printing including a printer control part, 1 or two or more consumable goods, a memory measure, and a network communication means, Are a host computer connected to said printer, and A network communication means, The date management tool for managing a date from a replacement date of consumable goods, and a means to read said print record information, A means to predict whether exchange time of consumable goods, etc. need to perform maintenance from print record information read from said printer, It has a displaying means which displays prediction results, such as existence of the necessity for maintenance for every consumable goods, and monitoring intervals of printed information accumulated in said printer from said host computer side are changed.

---

[Translation done.]